

Services Design for the CMS Phase II Inner Tracker

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To cope with High Luminosity LHC data taking conditions, the CMS Inner Tracker will be rebuilt for Phase II Upgrades. To limit particle occupancy at the per mille level and improve track resolution, we will increase the granularity of the sensors. This comes with a host of challenges for routing the cooling and electrical services, and optical cabling in the Inner Tracker, especially through the Service Cylinder connecting the Tracker Forward Pixel Detector (TFPX) and the Tracker Endcap Pixel Detector. We describe our solutions to these challenges. We also describe a “cartridge system” within the TFPX that will speed up installation and maintenance. Further, we describe a structural scheme that allows easy replacement of the inner sensor layers that will be most subject to radiation damage.

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